

What is claimed is:

1. An electrostatic coating spray gun 1 for electrifying,  
by using high voltage, a coating material atomized with  
compressed air and coating the same onto a substance to be coated,  
5 comprising:

a barrel 2 having a cylindrical section 36 formed, which  
protrudes forward from the outer peripheral edge of the forward  
end portion thereof;

a coating material nozzle 24, made of an insulating material,  
10 attached to the forward end portion of the barrel, internally  
having a coating material flow channel 29 and an atomization air  
flow channel 33 and having a coating material delivery port 30  
at the tip end thereof;

an air cap 40 for covering up the coating material nozzle  
15 24 and the front end face of the barrel 2; the same air cap 40  
being provided with a pair of square sections 39, in which an  
air gap that becomes a pattern air flow channel 45 is formed among  
the inner surface of the air cap 40, the outer peripheral surface  
of the coating material nozzle 24 and the inner peripheral surface  
20 of the cylindrical section 36, an atomization air spout hole 32  
is drilled, which has the coating material delivery port 30  
inserted in the middle region thereof, communicates with the  
atomization air flow channel 33, and spouts compressed air, a  
plurality of sub-pattern air spout holes 38a are drilled at the  
25 surrounding of the corresponding atomization air spout hole 32,  
which communicate with the atomization air flow channel 33 and  
spout compressed air, a pattern air spout hole 38 is drilled,  
which protrudes from both left and right end portions at the front

end, communicates with the pattern air flow channel 45, and spouts compressed air diagonally inwardly forward;

a pin electrode 31 protruding forward from the coating material delivery port 30; and

5 an electrode 13 annularly formed so as to surround the coating material nozzle 24 in the air gap that becomes the pattern air flow channel 45;

wherein high dc voltage is applied between the grounding and the electrode 13 with the pin electrode 31 grounded.

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2. The electrostatic coating spray gun according to Claim 1, wherein a floating electrode 50 penetrating the air cap 40 from the surface thereof to the rear side thereof is provided at two points apart by approximately one-half the radius of the  
15 corresponding air cap 40 in the direction orthogonal to the line connecting the center of the surface of the air cap 40 to the pair of square sections 39, and at the same time, the floating electrode 50 is attached so that the electrode 13 is formed to be semi-annular, and the distance between one end of the electrode  
20 13 and one electrode end of the floating electrode 50 is made equivalent to the distance between the other end of the electrode 13 and the other electrode end of the floating electrode 50.

3. An electrostatic coating spray gun for electrifying a  
25 coating material atomized by compressed air using high voltage and coating the same onto a substance to be coated, wherein the pin electrode 31 is caused to protrude from the middle region of the air cap 40 attached to the front surface portion of the

barrel 2 being the main body of the electrostatic coating spray gun 1, through the coating material delivery port 30 opening outwardly; the square sections 40d and 40e protruding forward from the coating material delivery port 30 are formed at the upper and lower positions in the diametrical direction of the air cap with the corresponding pin electrode 31 placed therebetween; insulatively shielded electrodes 13a and 13b whose surfaces are covered up with an electrically insulating material are accommodated in the interior of the corresponding square sections 40d and 40e; and high dc voltage is applied between the grounding and the insulatively shielded electrodes 13a and 13b with the pin electrode 31 grounded.

4. The electrostatic coating spray gun according to Claim 3, wherein square sections 40f and 40g projecting forward from the coating material delivery port 30 are further provided at the left and right positions in the diametrical direction of the air cap 40 with the pin electrode 31 placed therebetween; insulatively shielded electrodes 13f and 13g whose surface is covered up with an electrically insulating material are accommodated in the square sections 40f and 40g; and high dc voltage is applied between the grounding and the insulatively shielded electrodes 13f and 113g.

5. The electrostatic coating spray gun according to Claim 3, wherein, instead of the square sections 40d and 40e and the insulatively shielded electrodes 13a and 13b, a ring-shaped portion 29a projecting forward from the coating material

delivery port 30 is formed at the surrounding of the air cap 40 so that the ring-shaped portion 29a surrounds the pin electrode 31; a ring-shaped insulatively shielded electrode 13d whose surface is covered up with an electrically insulating material is accommodated in the interior of the ring-shaped portion 29a; and high dc voltage is applied between the grounding and the ring-shaped insulatively shielded electrode 13d with the pin electrode 31 grounded.

6. The electrostatic coating spray gun according to any one of Claims 1 through 5, wherein the pin electrode 31 is eliminated, instead thereof, a portion that forms the coating material delivery port 30 is composed of a conductive material, and a paint having conductivity is used as the coating material, and high dc voltage is applied between the grounding and the insulatively shielded electrode.

7. The electrostatic coating spray gun according to any one of Claims 1 through 5, wherein the pin electrode 31 is eliminated, a paint having conductivity is used as the coating material, and high dc voltage is applied between the grounding and the insulatively shielded electrode.

8. The electrostatic coating spray gun according to any one of Claims 1 through 5, wherein the pin electrode 31 is grounded by a wiring cable.

9. The electrostatic coating spray gun according to any one

of Claims 3 through 5, wherein a shaping air spout port 37a is provided at the outside portion of the outer cylinder of the air cap 40 in the vicinity of the tip end of the barrel 2 being the main body of the electrostatic coating spray gun, and compressed  
5 air is spouted forward along the outer cylinder surface of the air cap 40 from the corresponding shaping air spout port 37a.